Claims

What is claimed is:

1. A vaccine useful in preventing and treating diseases caused by a pathogen capable of infecting, or avoiding destruction by, macrophages, said vaccine comprising at least one vector that comprises at least one nucleotide sequence encoding at least one antigen derived from said pathogen, and wherein said antigen is capable of generating an immune response in a recipient thereof.

2. The vaccine of claim 1, wherein said pathogen is *P. acnes*, *L. monocytogenes*, *S. typhimurium*, *N. gonorrhoea*, *M. avium*, *M. tuberculosis*, *M. leprae*, *B. abortus*, *C. albicans*; *L. major*, or combinations thereof.

3. The vaccine of claim 2, wherein said pathogen is *P. acnes*.

4. The vaccine of claim 1, wherein said vector comprises naked DNA, a recombinant viral vector, or a combination of both.

5. The vaccine of claim 4, wherein said recombinant viral vector is selected from the group consisting of adenovirus, adeno-associated virus, herpes virus, vaccinia and RNA viruses.

6. The vaccine of claim 5, wherein said recombinant viral vector is an adenovirus.

7. The vaccine of claim 1, wherein said vector further comprises a nucleotide sequence encoding an adjuvant.

8. The vaccine of claim 7, wherein said adjuvant is a cytokine.

9. The vaccine of claim 8, wherein said cytokine is IL-2, IL-12, or both.

10. The vaccine of claim 1, wherein said antigen is a lipase gene or fragments thereof, a hyaluronidase gene or fragments thereof, a phosphatase gene or fragments thereof, or combinations of the foregoing.

11. A method of treating or preventing a disease caused by a pathogen capable of infecting, or avoiding destruction by, macrophages, said method comprising obtaining a vaccine comprising at least one vector that comprises at least one nucleotide sequence encoding at least one antigen derived from said pathogen; and administering said vaccine to a recipient in need thereof.

12. The method of claim 11, wherein said adminstering comprises routes of adminstration comprising oral, intravenous, intramuscular, transcutaneous, subcutaneous, aerosol, ocular, rectal, intraperitoneal, intrathecal, or combinations thereof.

13. The method of claim 12, wherein administering comprises transcutaneous administration.

14. The method of claim 13, wherein said transcutaneous administration comprises applying said at least one vector to a patch, and adhering said patch to skin of said recipient.

15. The method of claim 11, wherein said pathogen is *P. acnes*, *L. monocytogenes*, *S. typhimurium*, *N. gonorrhoea*, *M. avium*, *M. tuberculosis*, *M. leprae*, *B. abortus*, *C. albicans*; *L. major*, or combinations thereof.

16. The method of claim 15, wherein said pathogen is *P. acnes*.

17. The method of claim 11, wherein said at least one vector comprises naked DNA, a recombinant viral vector, or a combination of both.

18. The method of claim 17, wherein said recombinant viral vector is an adenovirus.

19. A kit comprising a container and one or more patches, wherein said patches have disposed thereon at least one vector comprising a nucleotide sequence encoding an antigen derived from a pathogen, said pathogen being capable of infecting, or avoiding destruction by, macrophages.

20. An article of manufacture comprising a vaccine solution disposed within a tube, vial, bottle, can, or syringe, wherein said vaccine solution comprises a viral vector comprising a nucleotide sequence encoding an antigen derived from a pathogen, said pathogen being capable of infecting, or avoiding destruction by, macrophages.

21. The vaccine of claim 1, wherein said vaccine is in the form of an aqueous solution.

22. The vaccine of claim 1, wherein said vaccine further comprises a nucleotide sequence encoding a co-stimulatory molecule.

23. The vaccine of claim 22, wherein said co-stimulatory molecule comprises a B7 protein, a CD40 protein or both.

24. A method of cosmetically improving the appearance of a person's skin who is suffering from acnes vulgaris, said method comprising the steps of obtaining a composition comprising a mixture of at least one vector that comprises at least one nucleotide sequence encoding at least one antigen derived from said P. acnes, and a cosmetic agent; and administering said composition to said person.